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Title : Fluctuating Asymmetry in Harbor Porpoises (*Phocoena phocoena*) - A Useful Bioindicator of Health?

Category : Conservation

Student : M.A./M.S.

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Abstract : Recently, conservation biologists have been investigating the usefulness of a relatively new tool, fluctuating asymmetry (FA), to assess the impact of environmental and genetic stresses on individuals and populations. FA is the result of small errors in developmental precision and is manifested as nondirectional asymmetries between the right and left sides of a bilateral trait. Increased FA has been correlated with reduced health and increased stresses for a variety of species suggesting that FA may be used as a bioindicator. Estimates of FA have benefits over traditional bioindicators because FA is easier, less costly, and in some cases, more sensitive (i.e. may reflect the effects of stress sooner) than traditional methods. Furthermore, FA generally poses little or no threat of increased stress during data collection methods on potentially sensitive animals. The paucity of FA studies on marine mammals is surprising given the expense and logistics of traditional methods of studying marine mammals in the wild. In the present study, we investigated the usefulness of FA as a bioindicator for small toothed whales using 200 harbor porpoise skull and skeletons. We compared the level of FA exhibited in 12 traits for healthy and unhealthy animals categorized based on cause of death (bycatch and stranded, respectively). We did not detect significant elevated levels in FA in any of the traits, nor in the composite FA index for stranded vs. bycatch animals. These results suggest that either the assumptions about the health of individuals were incorrect or that FA in these traits is not a useful bioindicator. In addition to estimating FA among groups, we investigated patterns of expression within individuals by comparing FA exhibited in skull, postcranial and soft tissue traits. Information about the variability in expression is important for interpreting overall FA estimates and for comparing results from different studies.